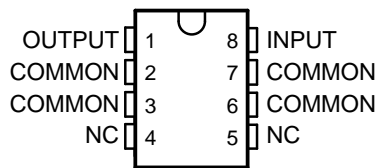


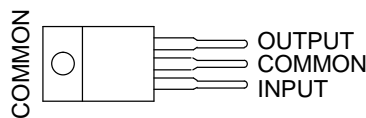
## FEATURES

- Very Low Dropout Voltage, Less Than 0.6 V at 150 mA
- Very Low Quiescent Current
- TTL- and CMOS-Compatible Enable on TL751L Series
- 60-V Load-Dump Protection
- Reverse Transient Protection Down to –50 V
- Internal Thermal-Overload Protection
- Overvoltage Protection
- Internal Overcurrent-Limiting Circuitry
- Less Than 500- $\mu$ A Disable (TL751L Series)

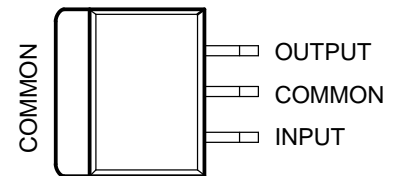
TL750L... D PACKAGE  
(TOP VIEW)



TL750L... KC PACKAGE  
(TOP VIEW)

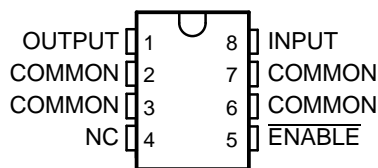


TL750L... KTE PACKAGE  
(TOP VIEW)

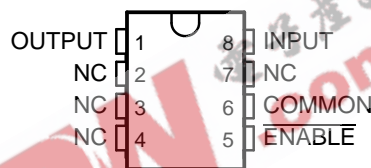


NC – No internal connection

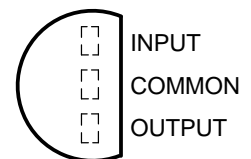
TL751L... D PACKAGE  
(TOP VIEW)



TL751L... P PACKAGE  
(TOP VIEW)



TL750L... LP PACKAGE  
(TO-92, TO-226AA)  
(TOP VIEW)



NC – No internal connection

NC – No internal connection

## DESCRIPTION/ORDERING INFORMATION

The TL750L and TL751L series of fixed-output voltage regulators offer 5-V, 8-V, 10-V, and 12-V options. The TL751L series also has an enable (ENABLE) input. When ENABLE is high, the regulator output is placed in the high-impedance state. This gives the designer complete control over power up, power down, or emergency shutdown.

The TL750L and TL751L series are low-dropout positive-voltage regulators specifically designed for battery-powered systems. These devices incorporate overvoltage and current-limiting protection circuitry, along with internal reverse-battery protection circuitry to protect the devices and the regulated system. The series is fully protected against 60-V load-dump and reverse-battery conditions. Extremely low quiescent current during full-load conditions makes these devices ideal for standby power systems.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

PowerFLEX is a trademark of Texas Instruments.

# TL750L, TL751L SERIES LOW-DROPOUT VOLTAGE REGULATORS

SLVS017S – SEPTEMBER 1987 – REVISED AUGUST 2005

## ORDERING INFORMATION

| T <sub>J</sub> | V <sub>O</sub> TYP<br>AT 25°C | PACKAGE <sup>(1)</sup> |                   | ORDERABLE PART NUMBER <sup>(2)</sup> | TOP-SIDE MARKING |         |
|----------------|-------------------------------|------------------------|-------------------|--------------------------------------|------------------|---------|
| 0°C to 125°C   | 5 V                           | PowerFLEX™ – KTE       | Reel of 2000      | TL750L05CKTER                        | TL750L05C        |         |
|                |                               | SOIC – D               | Tube of 75        | TL750L05CD                           | 50L05C           |         |
|                |                               |                        | Reel of 2500      | TL750L05CDR                          |                  |         |
|                |                               |                        | Tube of 75        | TL751L05CD                           | 51L05C           |         |
|                |                               |                        | Reel of 2500      | TL751L05CDR                          |                  |         |
|                |                               |                        | TO-226/TO-92 – LP | Bulk of 1000                         | TL750L05CLP      | 750L05C |
|                |                               |                        |                   | Reel of 2000                         | TL750L05CLPR     |         |
|                |                               | TO-220 – KC            | Tube of 50        | TL750L05CKC                          | TL750L05C        |         |
|                |                               | 8 V                    | SOIC – D          | Tube of 75                           | TL750L08CD       | 50L08C  |
|                |                               |                        |                   | Reel of 2500                         | TL750L08CDR      |         |
|                | TO-226/TO-92 – LP             |                        | Bulk of 1000      | TL750L08CLP                          | 750L08C          |         |
|                | 10 V                          | PDIP – P               | Tube of 50        | TL751L10CP                           | TL751L10C        |         |
|                |                               | SOIC – D               | Tube of 75        | TL750L10CD                           | 50L10C           |         |
|                |                               |                        | Reel of 2500      | TL750L10CDR                          |                  |         |
|                |                               |                        | Tube of 75        | TL751L10CD                           | 51L10C           |         |
|                |                               |                        | Reel of 2500      | TL751L10CDR                          |                  |         |
|                |                               | TO-226/TO-92 – LP      | Bulk of 1000      | TL750L10CLP                          | 750L10C          |         |
|                |                               |                        | Reel of 2000      | TL750L10CLPR                         |                  |         |
|                |                               | 12 V                   | SOIC – D          | Tube of 75                           | TL750L12CD       | 50L12C  |
|                | Reel of 2500                  |                        |                   | TL750L12CDR                          |                  |         |
|                | Tube of 75                    |                        |                   | TL751L12CD                           | 51L12C           |         |
|                | Reel of 2500                  |                        |                   | TL751L12CDR                          |                  |         |
|                | TO-226/TO-92 – LP             |                        | Bulk of 1000      | TL750L12CLP                          | 750L12C          |         |

(1) Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at [www.ti.com/sc/package](http://www.ti.com/sc/package).

(2) For the most current ordering information, see the Package Option Addendum at the end of this data sheet.

| DEVICE COMPONENT COUNT |    |
|------------------------|----|
| Transistors            | 20 |
| JFETs                  | 2  |
| Diodes                 | 5  |
| Resistors              | 16 |

### Absolute Maximum Ratings<sup>(1)</sup>

over operating junction temperature range (unless otherwise noted)

|                  |                                        | MIN                       | MAX | UNIT             |                  |
|------------------|----------------------------------------|---------------------------|-----|------------------|------------------|
|                  | Continuous input voltage               |                           | 26  | V                |                  |
|                  | Transient input voltage <sup>(2)</sup> | $T_A = 25^\circ\text{C}$  | 60  | V                |                  |
|                  | Continuous reverse input voltage       |                           | -15 | V                |                  |
|                  | Transient reverse input voltage        | $t \leq 100 \text{ ms}$   | -50 | V                |                  |
| $T_J$            | Operating virtual junction temperature |                           | 150 | $^\circ\text{C}$ |                  |
|                  | Lead temperature                       | 1,6 mm (1/16 in) for 10 s | 260 | $^\circ\text{C}$ |                  |
| $T_{\text{stg}}$ | Storage temperature range              |                           | -65 | 150              | $^\circ\text{C}$ |

- (1) Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) The transient input voltage rating applies to the waveform shown in Figure 1.

### Package Thermal Data<sup>(1)</sup>

| PACKAGE           | BOARD             | $\theta_{\text{JC}}$         | $\theta_{\text{JA}}$          |
|-------------------|-------------------|------------------------------|-------------------------------|
| PDIP (P)          | High K, JESD 51-7 | 57 $^\circ\text{C}/\text{W}$ | 85 $^\circ\text{C}/\text{W}$  |
| PowerFLEX™ (KTE)  | High K, JESD 51-5 | 3 $^\circ\text{C}/\text{W}$  | 23 $^\circ\text{C}/\text{W}$  |
| SOIC (D)          | High K, JESD 51-7 | 39 $^\circ\text{C}/\text{W}$ | 97 $^\circ\text{C}/\text{W}$  |
| TO-226/TO-92 (LP) | High K, JESD 51-7 | 55 $^\circ\text{C}/\text{W}$ | 140 $^\circ\text{C}/\text{W}$ |
| TO-220 (KC)       | High K, JESD 51-5 | 3 $^\circ\text{C}/\text{W}$  | 19 $^\circ\text{C}/\text{W}$  |

- (1) Maximum power dissipation is a function of  $T_J(\text{max})$ ,  $\theta_{\text{JA}}$ , and  $T_A$ . The maximum allowable power dissipation at any allowable ambient temperature is  $P_D = (T_J(\text{max}) - T_A)/\theta_{\text{JA}}$ . Operating at the absolute maximum  $T_J$  of 150 $^\circ\text{C}$  can affect reliability.

### Recommended Operating Conditions

over recommended operating junction temperature range (unless otherwise noted)

|                       |                                                     |                                               | MIN   | MAX | UNIT             |
|-----------------------|-----------------------------------------------------|-----------------------------------------------|-------|-----|------------------|
| $V_I$                 | Input voltage                                       | TL75xL05                                      | 6     | 26  | V                |
|                       |                                                     | TL75xL08                                      | 9     | 26  |                  |
|                       |                                                     | TL75xL10                                      | 11    | 26  |                  |
|                       |                                                     | TL75xL12                                      | 13    | 26  |                  |
| $V_{\text{IH}}$       | High-level $\overline{\text{ENABLE}}$ input voltage | TL75xLxx                                      | 2     | 15  | V                |
| $V_{\text{IL}}^{(1)}$ | Low-level $\overline{\text{ENABLE}}$ input voltage  | $T_J = 25^\circ\text{C}$                      | -0.3  | 0.8 | V                |
|                       |                                                     | $T_J = 0^\circ\text{C to } 125^\circ\text{C}$ | -0.15 | 0.8 |                  |
| $I_O$                 | Output current                                      | TL75xLxx                                      | 0     | 150 | mA               |
| $T_J$                 | Operating virtual junction temperature              | TL75xLxxC                                     | 0     | 125 | $^\circ\text{C}$ |

- (1) The algebraic convention, in which the least positive (most negative) value is designated minimum, is used in this data sheet for  $\overline{\text{ENABLE}}$  voltage levels and temperature only.

# TL750L, TL751L SERIES LOW-DROPOUT VOLTAGE REGULATORS

SLVS017S – SEPTEMBER 1987 – REVISED AUGUST 2005

## TL75xL05 Electrical Characteristics<sup>(1)</sup>

$V_I = 14\text{ V}$ ,  $I_O = 10\text{ mA}$ ,  $T_J = 25^\circ\text{C}$  (unless otherwise noted)

| PARAMETER                 | TEST CONDITIONS                                                                                           |                                               | TL750L05<br>TL751L05 |     |      | UNIT          |
|---------------------------|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------|----------------------|-----|------|---------------|
|                           |                                                                                                           |                                               | MIN                  | TYP | MAX  |               |
| Output voltage            | $V_I = 6\text{ V to } 26\text{ V}$ , $I_O = 0\text{ to } 150\text{ mA}$                                   | $T_J = 25^\circ\text{C}$                      | 4.8                  | 5   | 5.2  | V             |
|                           |                                                                                                           | $T_J = 0^\circ\text{C to } 125^\circ\text{C}$ | 4.75                 |     | 5.25 |               |
| Input regulation voltage  | $V_I = 9\text{ V to } 16\text{ V}$                                                                        |                                               |                      | 5   | 10   | mV            |
|                           | $V_I = 6\text{ V to } 26\text{ V}$                                                                        |                                               |                      | 6   | 30   |               |
| Ripple rejection          | $V_I = 8\text{ V to } 18\text{ V}$ , $f = 120\text{ Hz}$                                                  |                                               | 60                   | 65  |      | dB            |
| Output regulation voltage | $I_O = 5\text{ mA to } 150\text{ mA}$                                                                     |                                               |                      | 20  | 50   | mV            |
| Dropout voltage           | $I_O = 10\text{ mA}$                                                                                      |                                               |                      |     | 0.2  | V             |
|                           | $I_O = 150\text{ mA}$                                                                                     |                                               |                      |     | 0.6  |               |
| Output noise voltage      | $f = 10\text{ Hz to } 100\text{ kHz}$                                                                     |                                               |                      | 500 |      | $\mu\text{V}$ |
| Input bias current        | $I_O = 150\text{ mA}$                                                                                     |                                               |                      | 10  | 12   | mA            |
|                           | $V_I = 6\text{ V to } 26\text{ V}$ , $I_O = 10\text{ mA}$ , $T_J = 0^\circ\text{C to } 125^\circ\text{C}$ |                                               |                      | 1   | 2    |               |
|                           | $\text{ENABLE} \geq 2\text{ V}$                                                                           |                                               |                      |     | 0.5  |               |

(1) Pulse-testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a  $0.1\text{-}\mu\text{F}$  capacitor across the input and a  $10\text{-}\mu\text{F}$  capacitor, with equivalent series resistance of less than  $0.4\ \Omega$ , across the output.

## TL75xL08 Electrical Characteristics<sup>(1)</sup>

$V_I = 14\text{ V}$ ,  $I_O = 10\text{ mA}$ ,  $T_J = 25^\circ\text{C}$  (unless otherwise noted)

| PARAMETER                 | TEST CONDITIONS                                                                                           |                                               | TL750L08<br>TL751L08 |     |      | UNIT          |
|---------------------------|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------|----------------------|-----|------|---------------|
|                           |                                                                                                           |                                               | MIN                  | TYP | MAX  |               |
| Output voltage            | $V_I = 9\text{ V to } 26\text{ V}$ , $I_O = 0\text{ to } 150\text{ mA}$                                   | $T_J = 25^\circ\text{C}$                      | 7.68                 | 8   | 8.32 | V             |
|                           |                                                                                                           | $T_J = 0^\circ\text{C to } 125^\circ\text{C}$ | 7.6                  |     | 8.4  |               |
| Input regulation voltage  | $V_I = 10\text{ V to } 17\text{ V}$                                                                       |                                               |                      | 10  | 20   | mV            |
|                           | $V_I = 9\text{ V to } 26\text{ V}$                                                                        |                                               |                      | 25  | 50   |               |
| Ripple rejection          | $V_I = 11\text{ V to } 21\text{ V}$ , $f = 120\text{ Hz}$                                                 |                                               | 60                   | 65  |      | dB            |
| Output regulation voltage | $I_O = 5\text{ mA to } 150\text{ mA}$                                                                     |                                               |                      | 40  | 80   | mV            |
| Dropout voltage           | $I_O = 10\text{ mA}$                                                                                      |                                               |                      |     | 0.2  | V             |
|                           | $I_O = 150\text{ mA}$                                                                                     |                                               |                      |     | 0.6  |               |
| Output noise voltage      | $f = 10\text{ Hz to } 100\text{ kHz}$                                                                     |                                               |                      | 500 |      | $\mu\text{V}$ |
| Input bias current        | $I_O = 150\text{ mA}$                                                                                     |                                               |                      | 10  | 12   | mA            |
|                           | $V_I = 9\text{ V to } 26\text{ V}$ , $I_O = 10\text{ mA}$ , $T_J = 0^\circ\text{C to } 125^\circ\text{C}$ |                                               |                      | 1   | 2    |               |
|                           | $\text{ENABLE} \geq 2\text{ V}$                                                                           |                                               |                      |     | 0.5  |               |

(1) Pulse-testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a  $0.1\text{-}\mu\text{F}$  capacitor across the input and a  $10\text{-}\mu\text{F}$  capacitor, with equivalent series resistance of less than  $0.4\ \Omega$ , across the output.

### TL75xL10 Electrical Characteristics<sup>(1)</sup>

$V_I = 14\text{ V}$ ,  $I_O = 10\text{ mA}$ ,  $T_J = 25^\circ\text{C}$  (unless otherwise noted)

| PARAMETER                 | TEST CONDITIONS                                                                                          | TL750L10<br>TL751L10                         |     |     | UNIT          |   |
|---------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------|-----|-----|---------------|---|
|                           |                                                                                                          | MIN                                          | TYP | MAX |               |   |
| Output voltage            | $V_I = 11\text{ V to }26\text{ V}$ , $I_O = 0\text{ to }150\text{ mA}$                                   | $T_J = 25^\circ\text{C}$                     | 9.6 | 10  | 10.4          | V |
|                           |                                                                                                          | $T_J = 0^\circ\text{C to }125^\circ\text{C}$ | 9.5 |     | 10.5          |   |
| Input regulation voltage  | $V_I = 12\text{ V to }19\text{ V}$                                                                       |                                              | 10  | 25  | mV            |   |
|                           | $V_I = 11\text{ V to }26\text{ V}$                                                                       |                                              | 30  | 60  |               |   |
| Ripple rejection          | $V_I = 12\text{ V to }22\text{ V}$ , $f = 120\text{ Hz}$                                                 | 60                                           | 65  |     | dB            |   |
| Output regulation voltage | $I_O = 5\text{ mA to }150\text{ mA}$                                                                     |                                              | 50  | 100 | mV            |   |
| Dropout voltage           | $I_O = 10\text{ mA}$                                                                                     |                                              |     | 0.2 | V             |   |
|                           | $I_O = 150\text{ mA}$                                                                                    |                                              |     | 0.6 |               |   |
| Output noise voltage      | $f = 10\text{ Hz to }100\text{ kHz}$                                                                     |                                              | 700 |     | $\mu\text{V}$ |   |
| Input bias current        | $I_O = 150\text{ mA}$                                                                                    |                                              | 10  | 12  | mA            |   |
|                           | $V_I = 11\text{ V to }26\text{ V}$ , $I_O = 10\text{ mA}$ , $T_J = 0^\circ\text{C to }125^\circ\text{C}$ |                                              | 1   | 2   |               |   |
|                           | $\text{ENABLE} \geq 2\text{ V}$                                                                          |                                              |     | 0.5 |               |   |

(1) Pulse-testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a  $0.1\text{-}\mu\text{F}$  capacitor across the input and a  $10\text{-}\mu\text{F}$  capacitor, with equivalent series resistance of less than  $0.4\ \Omega$ , across the output.

### TL75xL12 Electrical Characteristics<sup>(1)</sup>

$V_I = 14\text{ V}$ ,  $I_O = 10\text{ mA}$ ,  $T_J = 25^\circ\text{C}$  (unless otherwise noted)

| PARAMETER                 | TEST CONDITIONS                                                                                          | TL750L12<br>TL751L12                         |       |     | UNIT          |   |
|---------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------|-------|-----|---------------|---|
|                           |                                                                                                          | MIN                                          | TYP   | MAX |               |   |
| Output voltage            | $V_I = 13\text{ V to }26\text{ V}$ , $I_O = 0\text{ to }150\text{ mA}$                                   | $T_J = 25^\circ\text{C}$                     | 11.52 | 12  | 12.48         | V |
|                           |                                                                                                          | $T_J = 0^\circ\text{C to }125^\circ\text{C}$ | 11.4  |     | 12.6          |   |
| Input regulation voltage  | $V_I = 14\text{ V to }19\text{ V}$                                                                       |                                              | 15    | 30  | mV            |   |
|                           | $V_I = 13\text{ V to }26\text{ V}$                                                                       |                                              | 20    | 40  |               |   |
| Ripple rejection          | $V_I = 13\text{ V to }23\text{ V}$ , $f = 120\text{ Hz}$                                                 | 50                                           | 55    |     | dB            |   |
| Output regulation voltage | $I_O = 5\text{ mA to }150\text{ mA}$                                                                     |                                              | 50    | 120 | mV            |   |
| Dropout voltage           | $I_O = 10\text{ mA}$                                                                                     |                                              |       | 0.2 | V             |   |
|                           | $I_O = 150\text{ mA}$                                                                                    |                                              |       | 0.6 |               |   |
| Output noise voltage      | $f = 10\text{ Hz to }100\text{ kHz}$                                                                     |                                              | 700   |     | $\mu\text{V}$ |   |
| Input bias current        | $I_O = 150\text{ mA}$                                                                                    |                                              | 10    | 12  | mA            |   |
|                           | $V_I = 13\text{ V to }26\text{ V}$ , $I_O = 10\text{ mA}$ , $T_J = 0^\circ\text{C to }125^\circ\text{C}$ |                                              | 1     | 2   |               |   |
|                           | $\text{ENABLE} \geq 2\text{ V}$                                                                          |                                              |       | 0.5 |               |   |

(1) Pulse-testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a  $0.1\text{-}\mu\text{F}$  capacitor across the input and a  $10\text{-}\mu\text{F}$  capacitor, with equivalent series resistance of less than  $0.4\ \Omega$ , across the output.

## PARAMETER MEASUREMENT INFORMATION

The TL750L, TL751L series are low-dropout regulators. This means that capacitance loading is important to the performance of the regulator because it is a vital part of the control loop. The capacitor value and its equivalent series resistance (ESR) both affect the control loop and must be defined for the load range and temperature range. Figure 1 shows the recommended range of ESR for a given load with a  $10\text{-}\mu\text{F}$  capacitor on the output.

TYPICAL CHARACTERISTICS

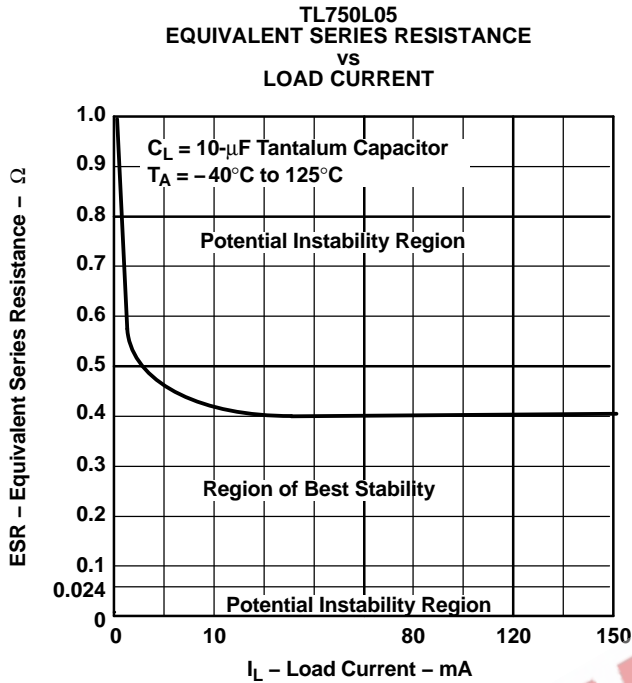


Figure 1.

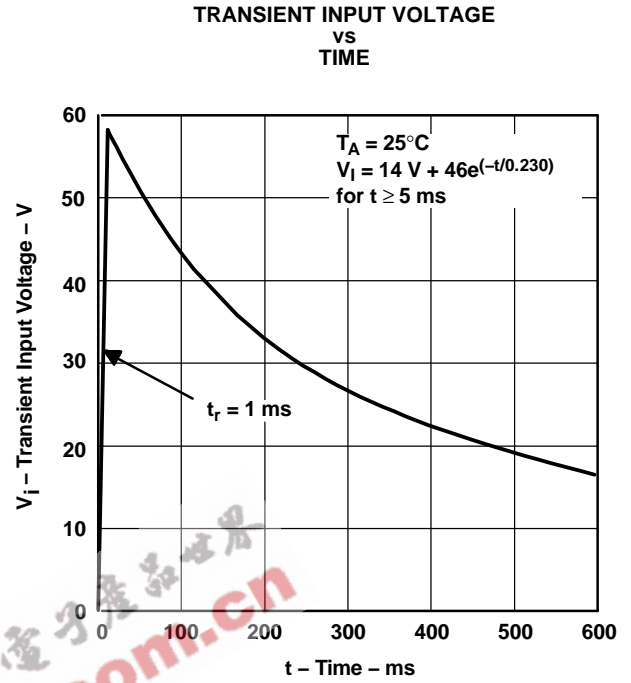


Figure 2.

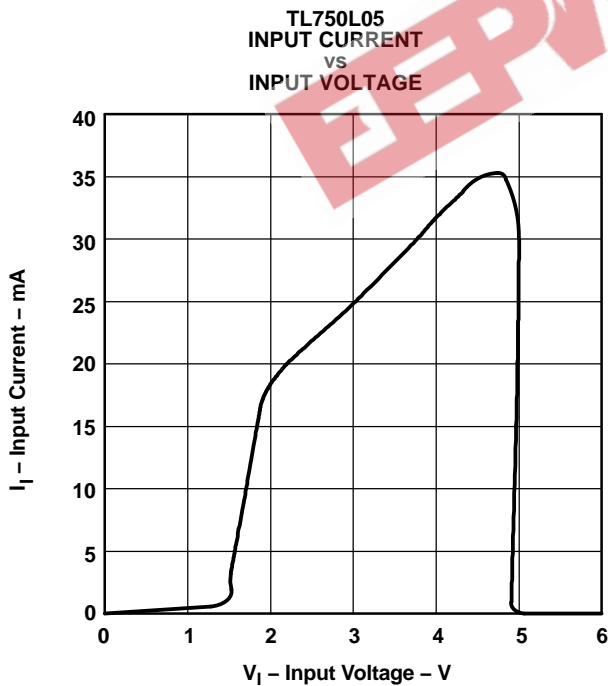


Figure 3.

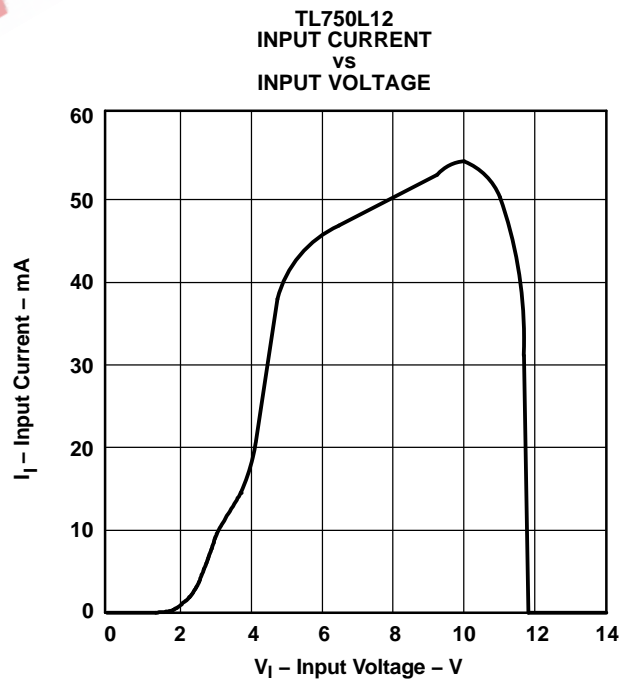


Figure 4.

**PACKAGING INFORMATION**

| Orderable Device | Status <sup>(1)</sup> | Package Type | Package Drawing | Pins | Package Qty | Eco Plan <sup>(2)</sup> | Lead/Ball Finish | MSL Peak Temp <sup>(3)</sup> |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|------------------------------|
| 5962-9166901Q2A  | OBSOLETE              | LCCC         | FK              | 20   |             | TBD                     | Call TI          | Call TI                      |
| 5962-9166901QPA  | OBSOLETE              | CDIP         | JG              | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL750L05CD       | ACTIVE                | SOIC         | D               | 8    | 75          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL750L05CDE4     | ACTIVE                | SOIC         | D               | 8    | 75          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL750L05CDR      | ACTIVE                | SOIC         | D               | 8    | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL750L05CDRE4    | ACTIVE                | SOIC         | D               | 8    | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL750L05CKC      | NRND                  | TO-220       | KC              | 3    | 50          | Pb-Free (RoHS)          | CU SN            | N / A for Pkg Type           |
| TL750L05CKCE3    | NRND                  | TO-220       | KC              | 3    | 50          | Pb-Free (RoHS)          | CU SN            | N / A for Pkg Type           |
| TL750L05CKCS     | ACTIVE                | TO-220       | KCS             | 3    | 50          | Pb-Free (RoHS)          | CU SN            | N / A for Pkg Type           |
| TL750L05CKTER    | NRND                  | PFM          | KTE             | 3    | 2000        | TBD                     | CU SNPB          | Level-1-220C-UNLIM           |
| TL750L05CLP      | ACTIVE                | TO-92        | LP              | 3    | 1000        | Pb-Free (RoHS)          | CU SN            | N / A for Pkg Type           |
| TL750L05CLPE3    | ACTIVE                | TO-92        | LP              | 3    | 1000        | Pb-Free (RoHS)          | CU SN            | N / A for Pkg Type           |
| TL750L05CLPM     | OBSOLETE              | TO-92        | LP              | 3    |             | TBD                     | Call TI          | Call TI                      |
| TL750L05CLPR     | ACTIVE                | TO-92        | LP              | 3    | 2000        | Pb-Free (RoHS)          | CU SN            | N / A for Pkg Type           |
| TL750L05CLPRE3   | ACTIVE                | TO-92        | LP              | 3    | 2000        | Pb-Free (RoHS)          | CU SN            | N / A for Pkg Type           |
| TL750L05CP       | OBSOLETE              | PDIP         | P               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL750L05QD       | OBSOLETE              | SOIC         | D               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL750L05QDR      | OBSOLETE              | SOIC         | D               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL750L05QKC      | OBSOLETE              | TO-220       | KC              | 3    |             | TBD                     | Call TI          | Call TI                      |
| TL750L05QLP      | OBSOLETE              | TO-92        | LP              | 3    |             | TBD                     | Call TI          | Call TI                      |
| TL750L05QP       | OBSOLETE              | PDIP         | P               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL750L08CD       | ACTIVE                | SOIC         | D               | 8    | 75          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-2-260C-1YEAR           |
| TL750L08CDE4     | ACTIVE                | SOIC         | D               | 8    | 75          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-2-260C-1YEAR           |
| TL750L08CDR      | ACTIVE                | SOIC         | D               | 8    | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-2-260C-1YEAR           |
| TL750L08CDRE4    | ACTIVE                | SOIC         | D               | 8    | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-2-260C-1YEAR           |
| TL750L08CKC      | OBSOLETE              | TO-220       | KC              | 3    |             | TBD                     | Call TI          | Call TI                      |
| TL750L08CLP      | ACTIVE                | TO-92        | LP              | 3    | 1000        | Pb-Free (RoHS)          | CU SN            | N / A for Pkg Type           |
| TL750L08CLPE3    | ACTIVE                | TO-92        | LP              | 3    | 1000        | Pb-Free (RoHS)          | CU SN            | N / A for Pkg Type           |
| TL750L08CP       | OBSOLETE              | PDIP         | P               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL750L08QD       | OBSOLETE              | SOIC         | D               | 8    |             | TBD                     | Call TI          | Call TI                      |

| Orderable Device | Status <sup>(1)</sup> | Package Type | Package Drawing | Pins | Package Qty | Eco Plan <sup>(2)</sup> | Lead/Ball Finish | MSL Peak Temp <sup>(3)</sup> |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|------------------------------|
| TL750L08QDR      | OBSOLETE              | SOIC         | D               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL750L08QKC      | OBSOLETE              | TO-220       | KC              | 3    |             | TBD                     | Call TI          | Call TI                      |
| TL750L08QLP      | OBSOLETE              | TO-92        | LP              | 3    |             | TBD                     | Call TI          | Call TI                      |
| TL750L10CD       | ACTIVE                | SOIC         | D               | 8    | 75          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL750L10CDE4     | ACTIVE                | SOIC         | D               | 8    | 75          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL750L10CDR      | ACTIVE                | SOIC         | D               | 8    | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL750L10CDRE4    | ACTIVE                | SOIC         | D               | 8    | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL750L10CKC      | OBSOLETE              | TO-220       | KC              | 3    |             | TBD                     | Call TI          | Call TI                      |
| TL750L10CLP      | ACTIVE                | TO-92        | LP              | 3    | 1000        | Pb-Free (RoHS)          | CU SN            | N / A for Pkg Type           |
| TL750L10CLPE3    | ACTIVE                | TO-92        | LP              | 3    | 1000        | Pb-Free (RoHS)          | CU SN            | N / A for Pkg Type           |
| TL750L10CLPR     | ACTIVE                | TO-92        | LP              | 3    | 2000        | Pb-Free (RoHS)          | CU SN            | N / A for Pkg Type           |
| TL750L10CLPRE3   | ACTIVE                | TO-92        | LP              | 3    | 2000        | Pb-Free (RoHS)          | CU SN            | N / A for Pkg Type           |
| TL750L10CP       | OBSOLETE              | PDIP         | P               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL750L10QD       | OBSOLETE              | SOIC         | D               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL750L10QDR      | OBSOLETE              | SOIC         | D               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL750L10QKC      | OBSOLETE              | TO-220       | KC              | 3    |             | TBD                     | Call TI          | Call TI                      |
| TL750L10QLP      | OBSOLETE              | TO-92        | LP              | 3    |             | TBD                     | Call TI          | Call TI                      |
| TL750L10QP       | OBSOLETE              | PDIP         | P               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL750L12CD       | ACTIVE                | SOIC         | D               | 8    | 75          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL750L12CDE4     | ACTIVE                | SOIC         | D               | 8    | 75          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL750L12CDR      | ACTIVE                | SOIC         | D               | 8    | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL750L12CDRE4    | ACTIVE                | SOIC         | D               | 8    | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL750L12CKC      | OBSOLETE              | TO-220       | KC              | 3    |             | TBD                     | Call TI          | Call TI                      |
| TL750L12CLP      | ACTIVE                | TO-92        | LP              | 3    | 1000        | Pb-Free (RoHS)          | CU SN            | N / A for Pkg Type           |
| TL750L12CLPE3    | ACTIVE                | TO-92        | LP              | 3    | 1000        | Pb-Free (RoHS)          | CU SN            | N / A for Pkg Type           |
| TL750L12CP       | OBSOLETE              | PDIP         | P               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL750L12QD       | OBSOLETE              | SOIC         | D               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL750L12QDR      | OBSOLETE              | SOIC         | D               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL750L12QKC      | OBSOLETE              | TO-220       | KC              | 3    |             | TBD                     | Call TI          | Call TI                      |
| TL750L12QLP      | OBSOLETE              | TO-92        | LP              | 3    |             | TBD                     | Call TI          | Call TI                      |
| TL750L12QP       | OBSOLETE              | SOIC         | D               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL751L05CD       | ACTIVE                | SOIC         | D               | 8    | 75          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL751L05CDE4     | ACTIVE                | SOIC         | D               | 8    | 75          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |



| Orderable Device | Status <sup>(1)</sup> | Package Type | Package Drawing | Pins | Package Qty | Eco Plan <sup>(2)</sup> | Lead/Ball Finish | MSL Peak Temp <sup>(3)</sup> |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|------------------------------|
|                  |                       |              |                 |      |             | no Sb/Br)               |                  |                              |
| TL751L05CDR      | ACTIVE                | SOIC         | D               | 8    | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL751L05CDRE4    | ACTIVE                | SOIC         | D               | 8    | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL751L05CP       | OBSOLETE              | PDIP         | P               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL751L05MFKB     | OBSOLETE              | LCCC         | FK              | 20   |             | TBD                     | Call TI          | Call TI                      |
| TL751L05MJGB     | OBSOLETE              | CDIP         | JG              | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL751L05QD       | OBSOLETE              | SOIC         | D               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL751L05QDR      | OBSOLETE              | SOIC         | D               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL751L05QP       | OBSOLETE              | PDIP         | P               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL751L10CD       | ACTIVE                | SOIC         | D               | 8    | 75          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL751L10CDE4     | ACTIVE                | SOIC         | D               | 8    | 75          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL751L10CDR      | ACTIVE                | SOIC         | D               | 8    | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL751L10CDRE4    | ACTIVE                | SOIC         | D               | 8    | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL751L10CP       | ACTIVE                | PDIP         | P               | 8    | 50          | Pb-Free (RoHS)          | CU NIPDAU        | N / A for Pkg Type           |
| TL751L10CPE4     | ACTIVE                | PDIP         | P               | 8    | 50          | Pb-Free (RoHS)          | CU NIPDAU        | N / A for Pkg Type           |
| TL751L10QD       | OBSOLETE              | SOIC         | D               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL751L10QP       | OBSOLETE              | PDIP         | P               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL751L12CD       | ACTIVE                | SOIC         | D               | 8    | 75          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL751L12CDE4     | ACTIVE                | SOIC         | D               | 8    | 75          | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL751L12CDR      | ACTIVE                | SOIC         | D               | 8    | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL751L12CDRE4    | ACTIVE                | SOIC         | D               | 8    | 2500        | Green (RoHS & no Sb/Br) | CU NIPDAU        | Level-1-260C-UNLIM           |
| TL751L12CP       | OBSOLETE              | PDIP         | P               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL751L12MFKB     | OBSOLETE              | LCCC         | FK              | 20   |             | TBD                     | Call TI          | Call TI                      |
| TL751L12MJGB     | OBSOLETE              | CDIP         | JG              | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL751L12QD       | OBSOLETE              | SOIC         | D               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL751L12QDR      | OBSOLETE              | SOIC         | D               | 8    |             | TBD                     | Call TI          | Call TI                      |
| TL751L12QP       | OBSOLETE              | PDIP         | P               | 8    |             | TBD                     | Call TI          | Call TI                      |

<sup>(1)</sup> The marketing status values are defined as follows:

**ACTIVE:** Product device recommended for new designs.

**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

**NRND:** Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.

**OBSOLETE:** TI has discontinued the production of the device.

<sup>(2)</sup> Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

---

**TBD:** The Pb-Free/Green conversion plan has not been defined.

**Pb-Free (RoHS):** TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

**Pb-Free (RoHS Exempt):** This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

**Green (RoHS & no Sb/Br):** TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

<sup>(3)</sup> MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

**Important Information and Disclaimer:**The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

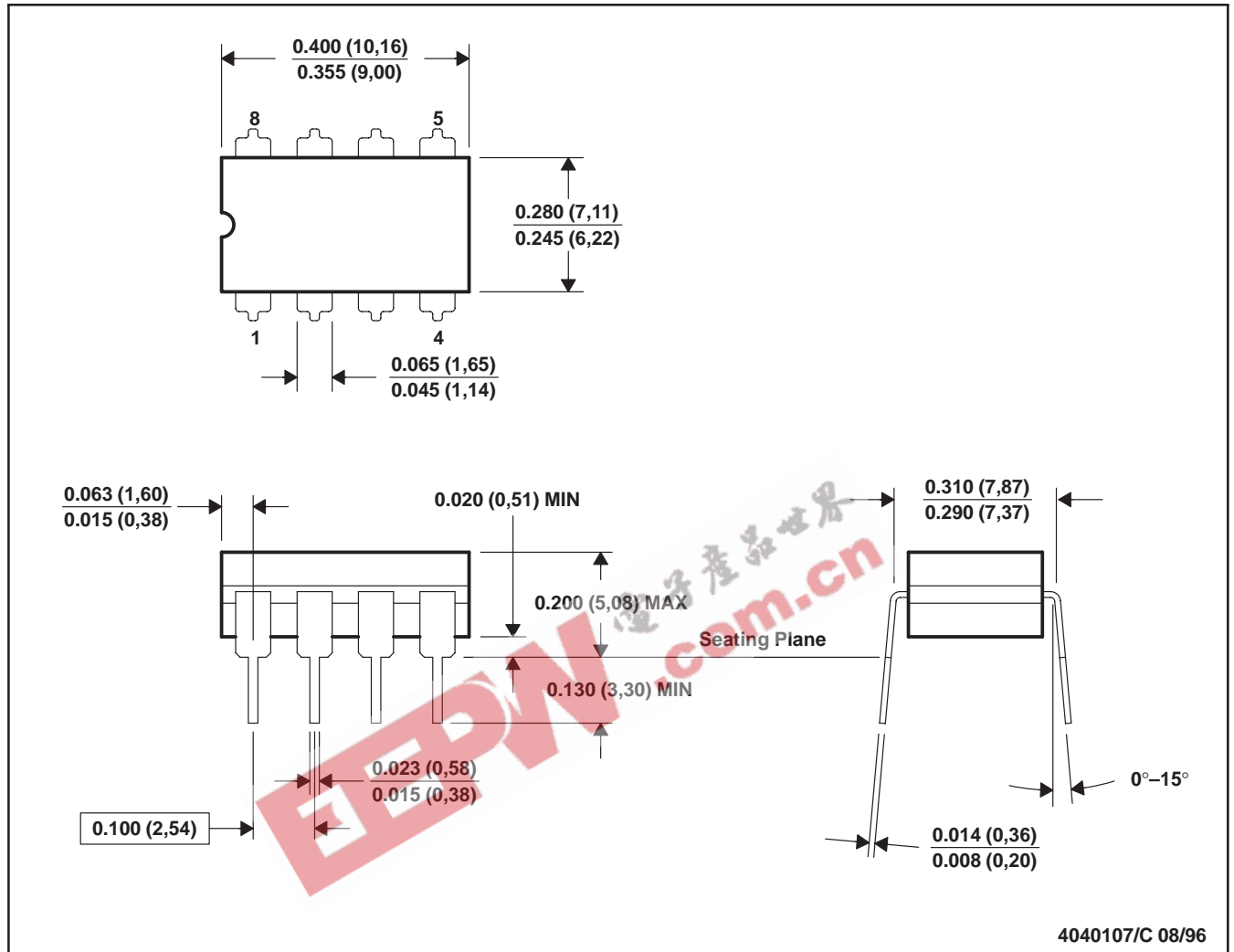
EEPW 电子产品世界 .com.cn

# MECHANICAL DATA

MCER001A – JANUARY 1995 – REVISED JANUARY 1997

JG (R-GDIP-T8)

CERAMIC DUAL-IN-LINE



- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - This package can be hermetically sealed with a ceramic lid using glass frit.
  - Index point is provided on cap for terminal identification.
  - Falls within MIL STD 1835 GDIP1-T8

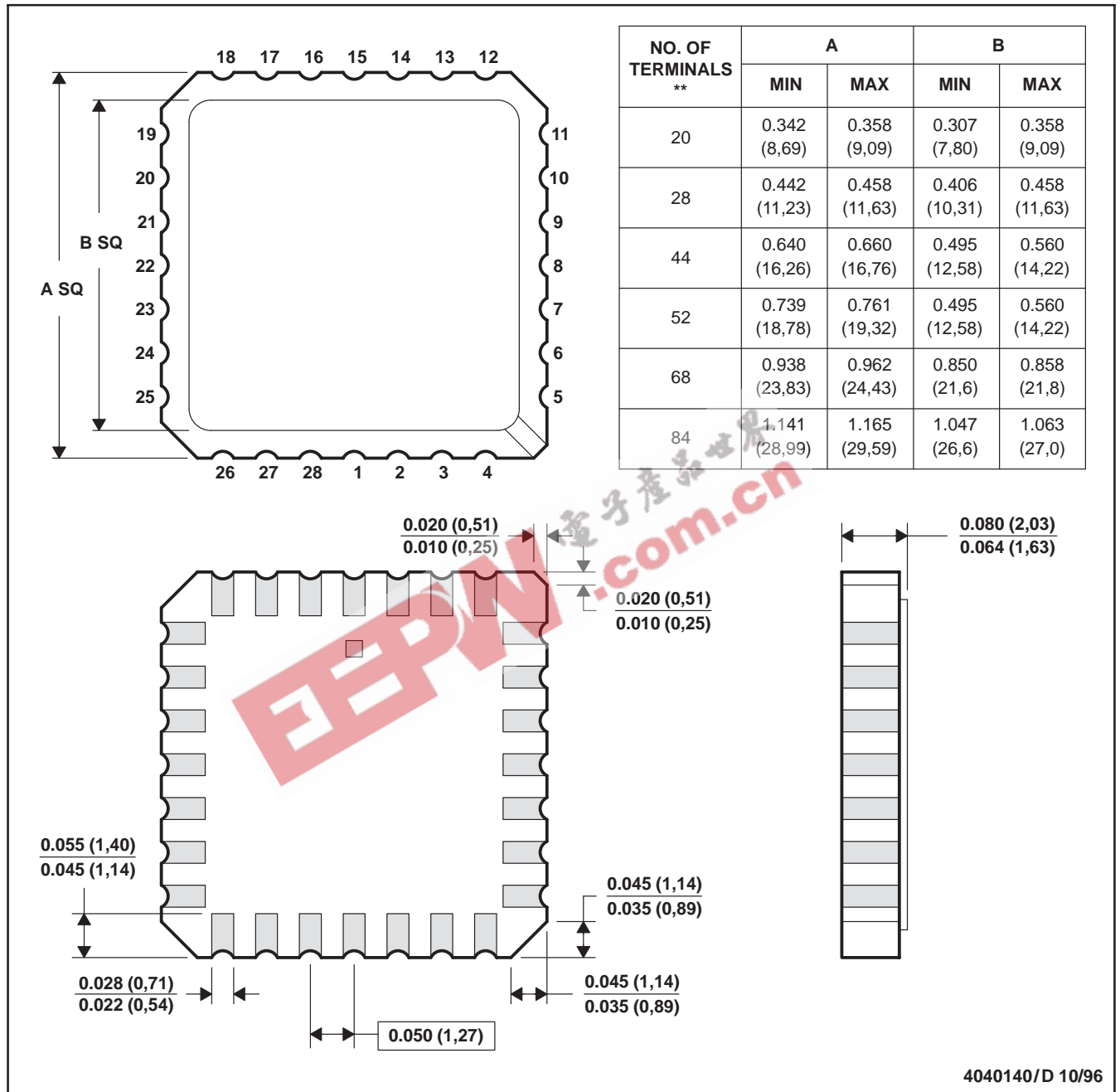
# MECHANICAL DATA

MLCC006B – OCTOBER 1996

## FK (S-CQCC-N\*\*)

## LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



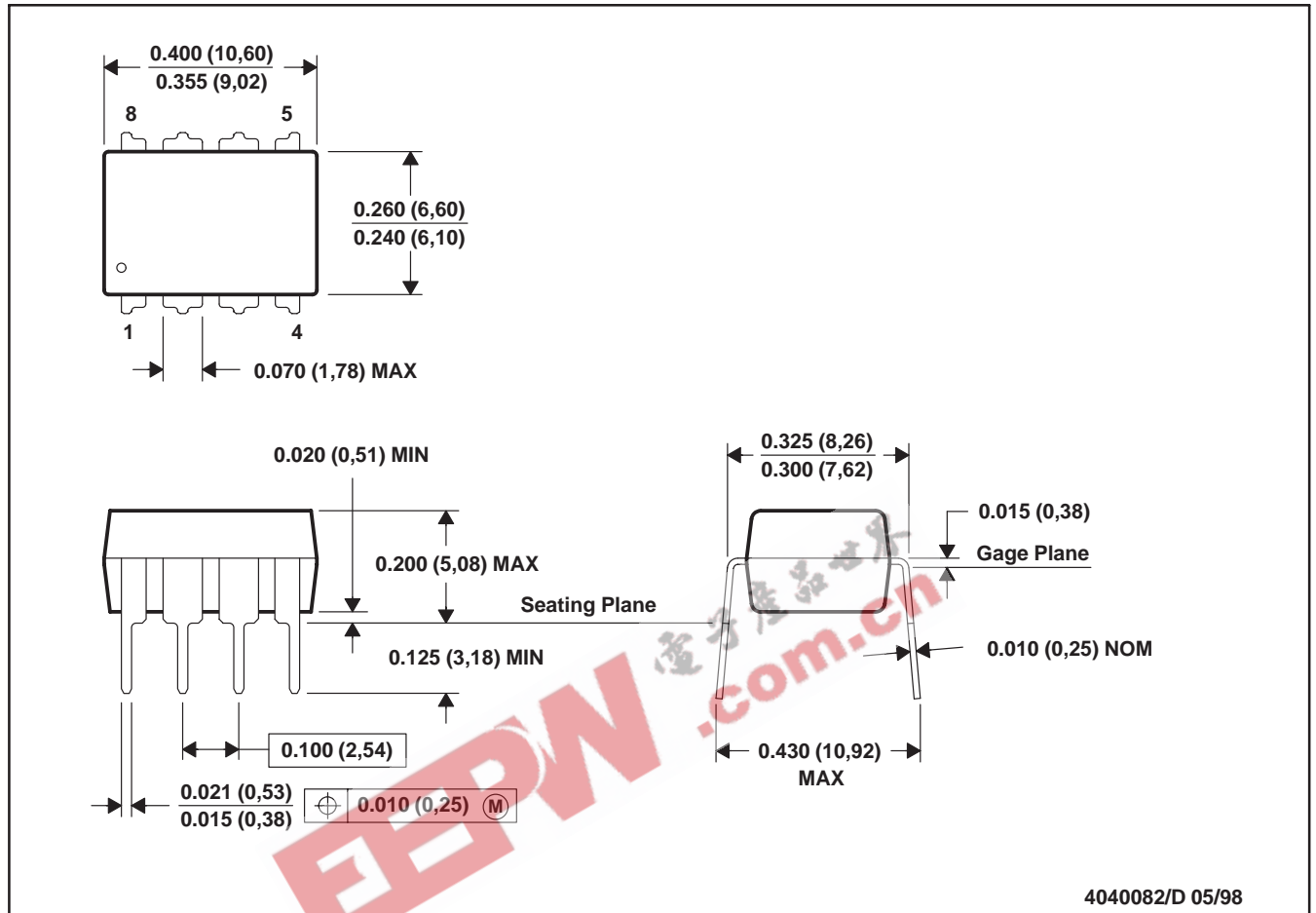
- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - C. This package can be hermetically sealed with a metal lid.
  - D. The terminals are gold plated.
  - E. Falls within JEDEC MS-004

# MECHANICAL DATA

MPDI001A – JANUARY 1995 – REVISED JUNE 1999

## P (R-PDIP-T8)

## PLASTIC DUAL-IN-LINE



- NOTES: A. All linear dimensions are in inches (millimeters).  
 B. This drawing is subject to change without notice.  
 C. Falls within JEDEC MS-001

For the latest package information, go to [http://www.ti.com/sc/docs/package/pkg\\_info.htm](http://www.ti.com/sc/docs/package/pkg_info.htm)



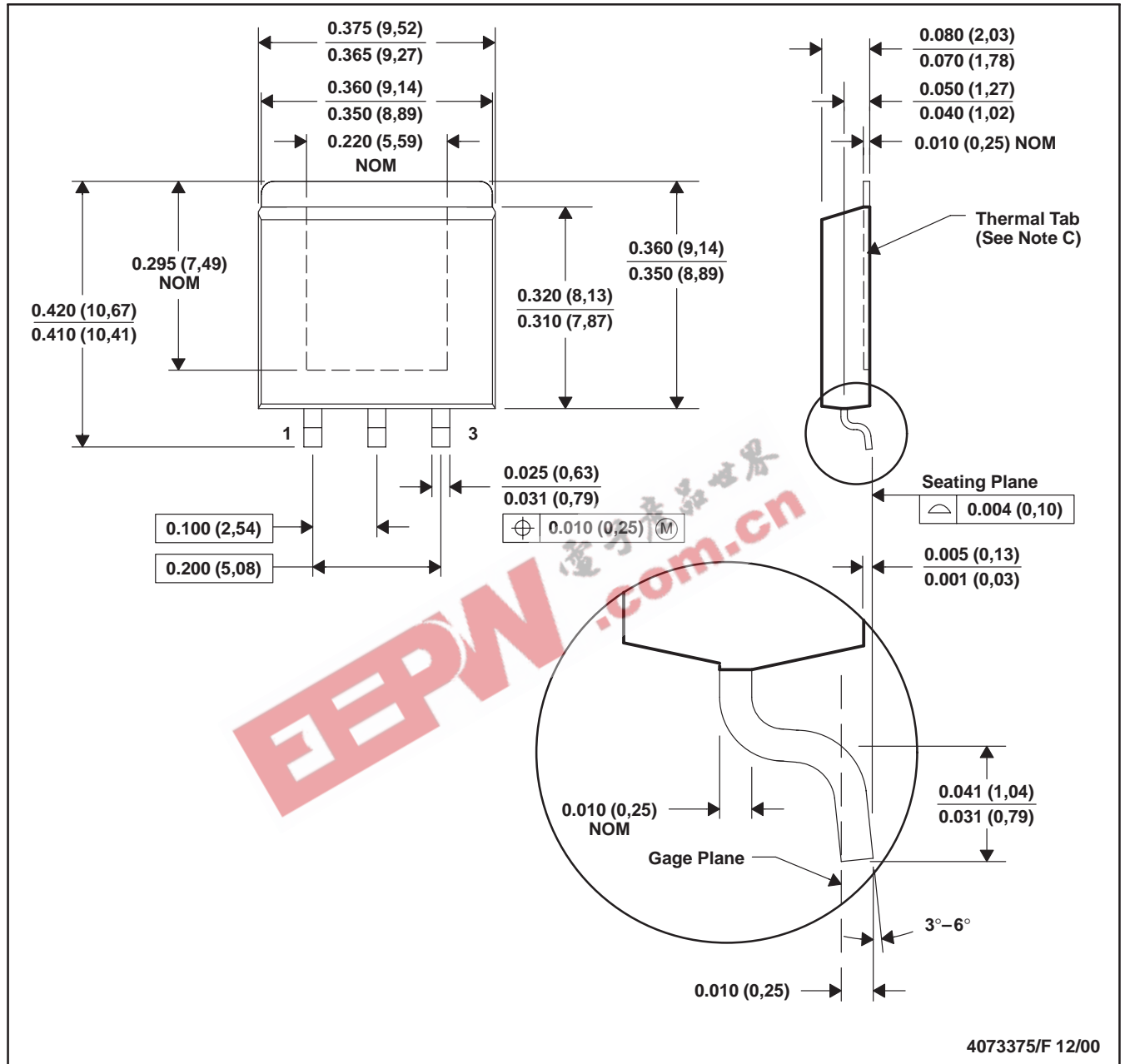
POST OFFICE BOX 655303 • DALLAS, TEXAS 75265

# MECHANICAL DATA

MPFM001E – OCTOBER 1994 – REVISED JANUARY 2001

KTE (R-PSFM-G3)

PowerFLEX™ PLASTIC FLANGE-MOUNT



- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - The center lead is in electrical contact with the thermal tab.
  - Dimensions do not include mold protrusions, not to exceed 0.006 (0,15).
  - Falls within JEDEC MO-169

PowerFLEX is a trademark of Texas Instruments.

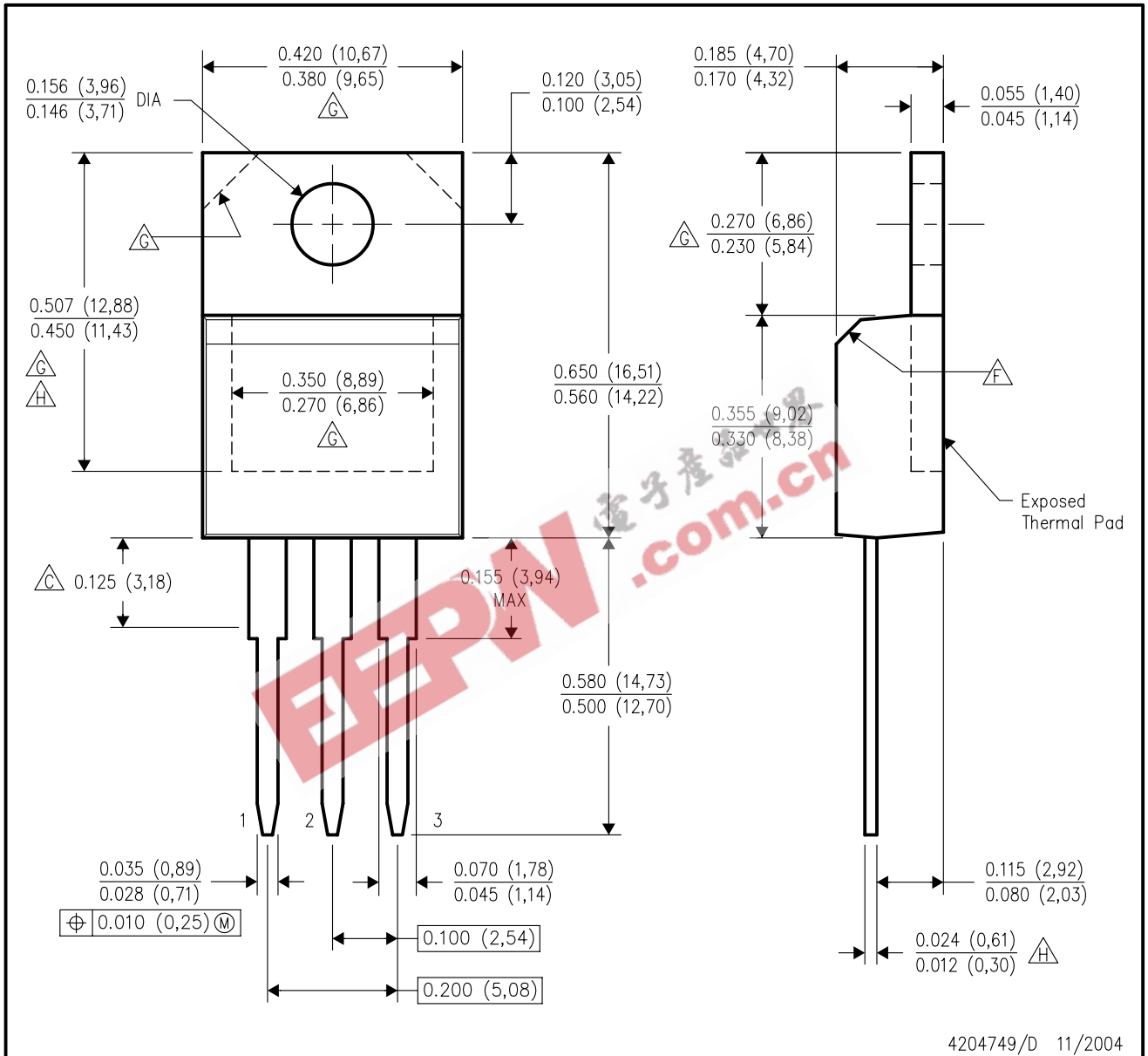
 **TEXAS  
INSTRUMENTS**

POST OFFICE BOX 655303 • DALLAS, TEXAS 75265

# MECHANICAL DATA

## KCS (R-PSFM-T3)

## PLASTIC FLANGE-MOUNT PACKAGE

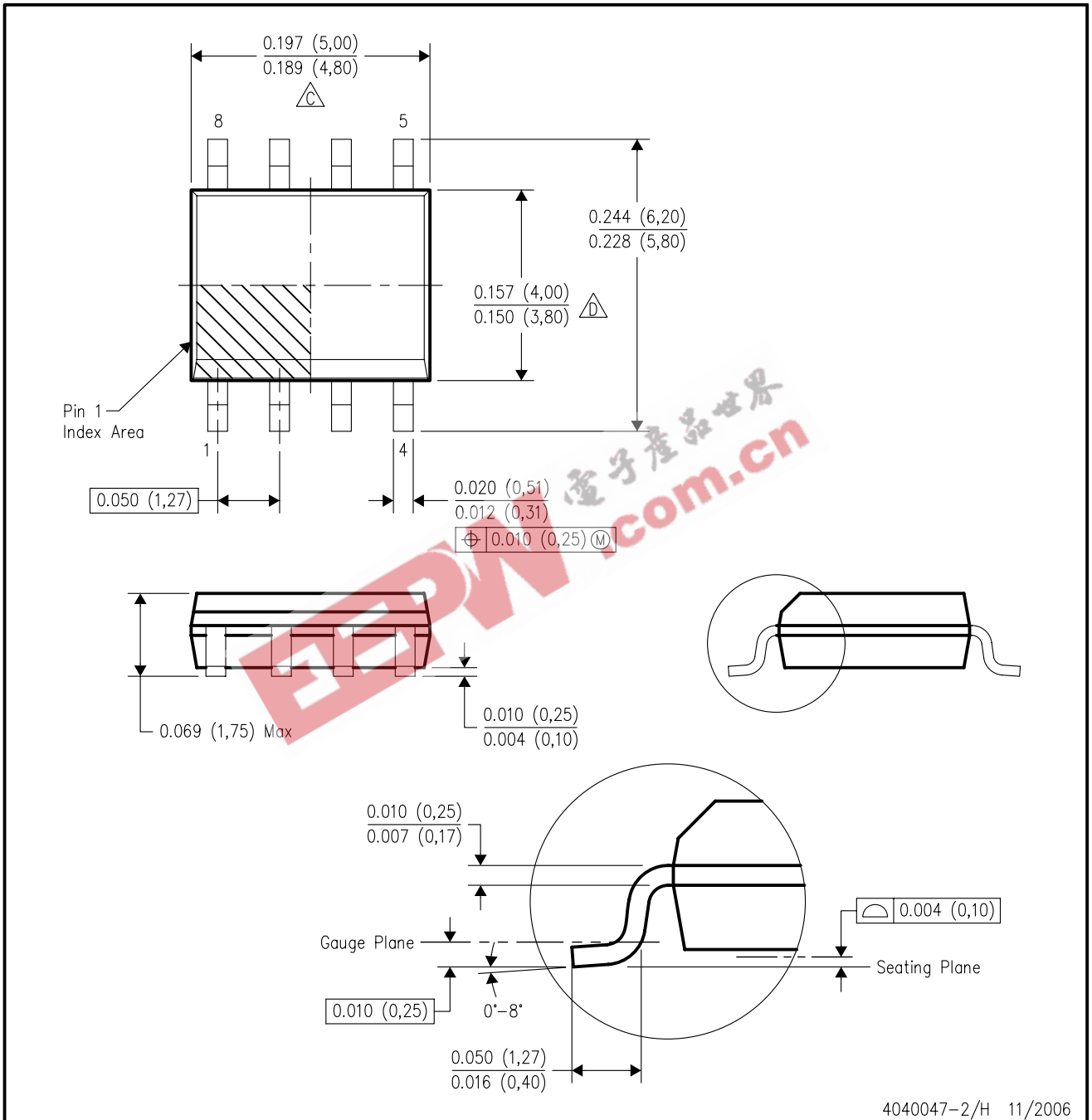


- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - $\triangle C$  Lead dimensions are not controlled within this area.
  - D. All lead dimensions apply before solder dip.
  - E. The center lead is in electrical contact with the mounting tab.
  - $\triangle F$  The chamfer is optional.
  - $\triangle G$  Thermal pad contour optional within these dimensions.
  - $\triangle H$  Falls within JEDEC TO-220 variation AB, except minimum lead thickness and minimum exposed pad length.

# MECHANICAL DATA

## D (R-PDSO-G8)

## PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - $\triangle C$  Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed .006 (0,15) per end.
  - $\triangle D$  Body width does not include interlead flash. Interlead flash shall not exceed .017 (0,43) per side.
  - E. Reference JEDEC MS-012 variation AA.

4040047-2/H 11/2006

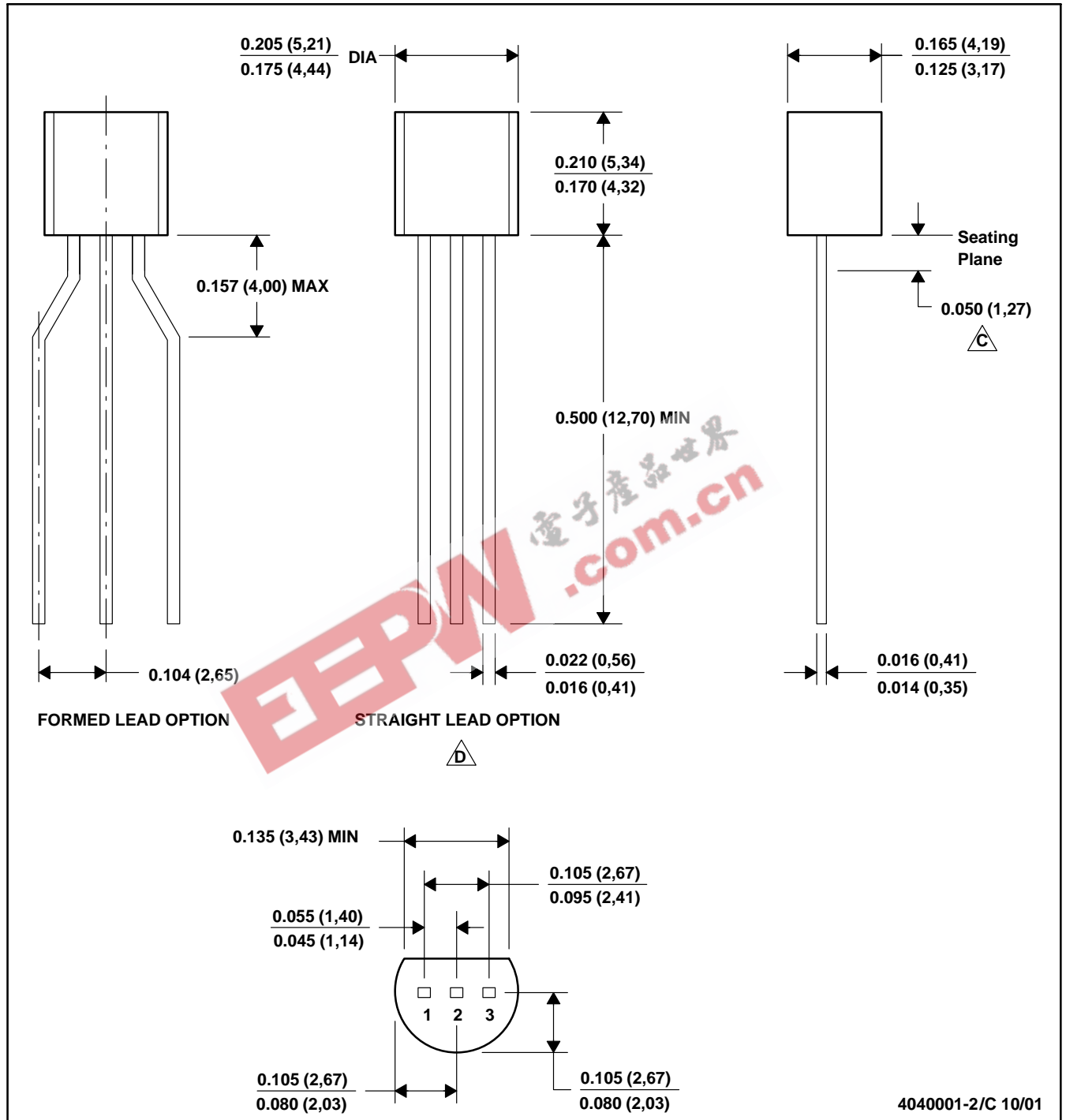


# MECHANICAL DATA

MSOT002A – OCTOBER 1994 – REVISED NOVEMBER 2001

## LP (O-PBCY-W3)

## PLASTIC CYLINDRICAL PACKAGE



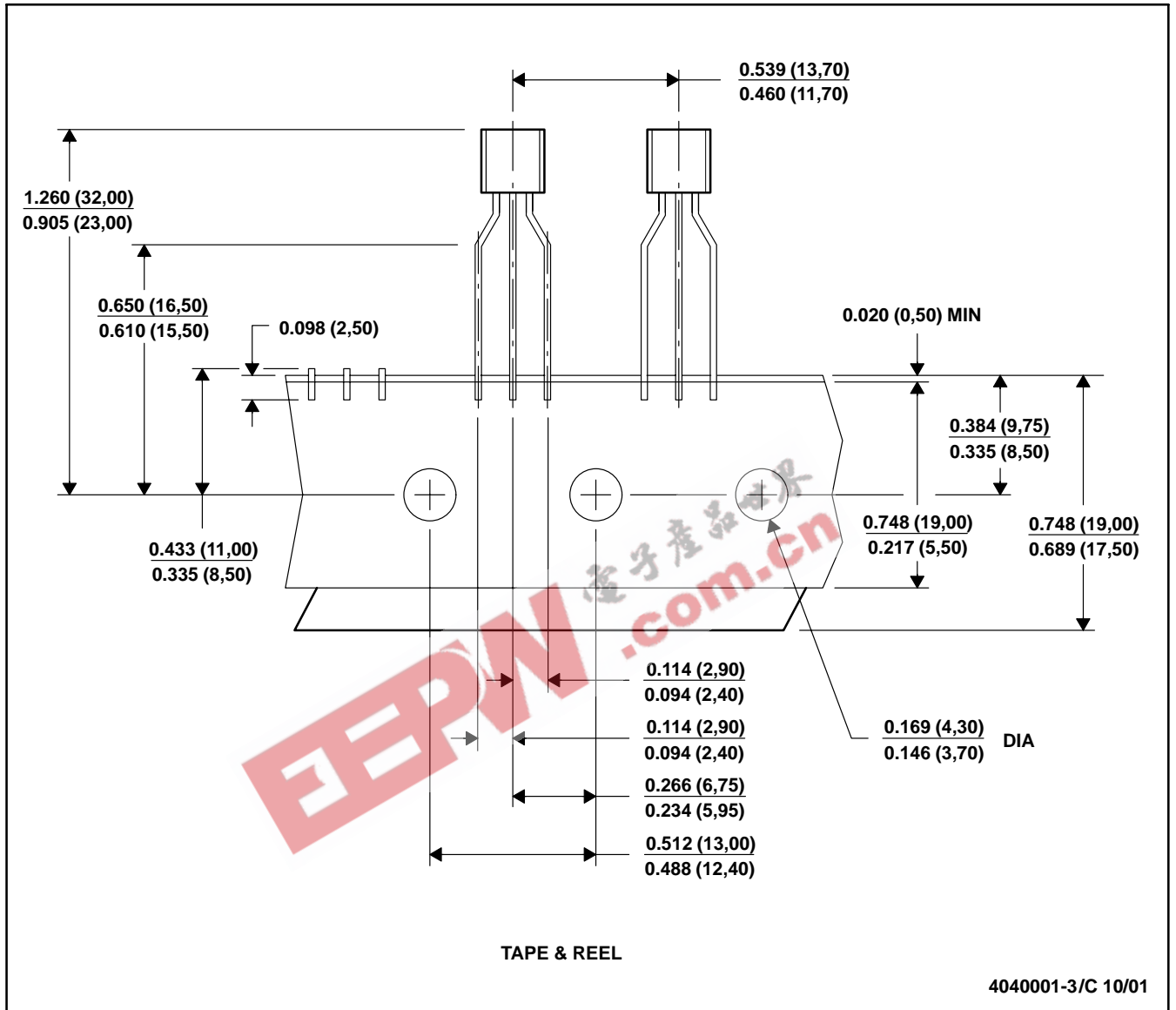
4040001-2/C 10/01

# MECHANICAL DATA

MSOT002A – OCTOBER 1994 – REVISED NOVEMBER 2001

LP (O-PBCY-W3)

PLASTIC CYLINDRICAL PACKAGE

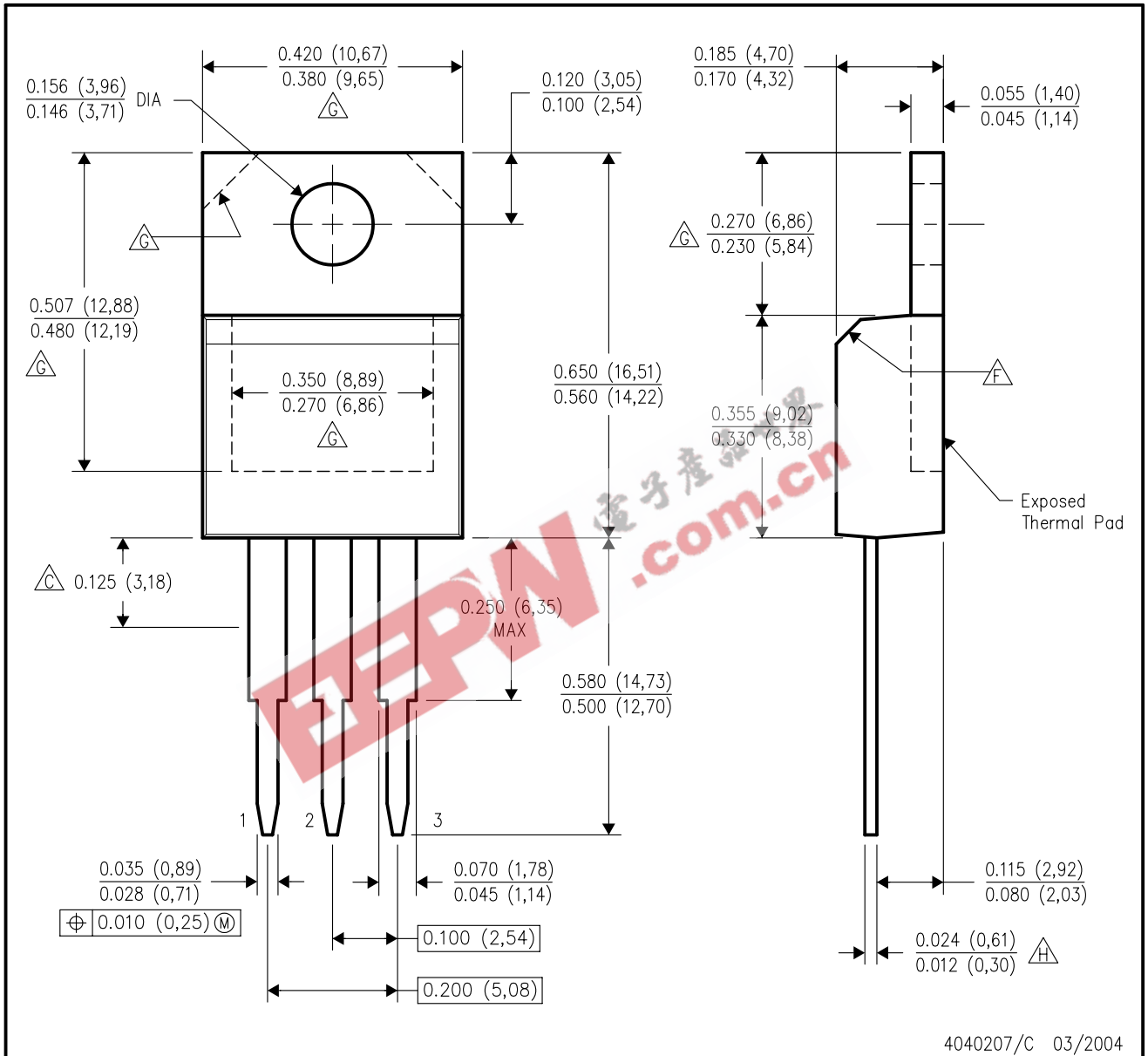


- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - Tape and Reel information for the Format Lead Option package.

# MECHANICAL DATA

## KC (R-PSFM-T3)

## PLASTIC FLANGE-MOUNT PACKAGE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - $\triangle C$  Lead dimensions are not controlled within this area.
  - D. All lead dimensions apply before solder dip.
  - E. The center lead is in electrical contact with the mounting tab.
  - $\triangle F$  The chamfer is optional.
  - $\triangle G$  Thermal pad contour optional within these dimensions.
  - $\triangle H$  Falls within JEDEC TO-220 variation AB, except minimum lead thickness.

## IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

| <b>Products</b>    |                                                                    | <b>Applications</b> |                                                                          |
|--------------------|--------------------------------------------------------------------|---------------------|--------------------------------------------------------------------------|
| Amplifiers         | <a href="http://amplifier.ti.com">amplifier.ti.com</a>             | Audio               | <a href="http://www.ti.com/audio">www.ti.com/audio</a>                   |
| Data Converters    | <a href="http://dataconverter.ti.com">dataconverter.ti.com</a>     | Automotive          | <a href="http://www.ti.com/automotive">www.ti.com/automotive</a>         |
| DSP                | <a href="http://dsp.ti.com">dsp.ti.com</a>                         | Broadband           | <a href="http://www.ti.com/broadband">www.ti.com/broadband</a>           |
| Interface          | <a href="http://interface.ti.com">interface.ti.com</a>             | Digital Control     | <a href="http://www.ti.com/digitalcontrol">www.ti.com/digitalcontrol</a> |
| Logic              | <a href="http://logic.ti.com">logic.ti.com</a>                     | Military            | <a href="http://www.ti.com/military">www.ti.com/military</a>             |
| Power Mgmt         | <a href="http://power.ti.com">power.ti.com</a>                     | Optical Networking  | <a href="http://www.ti.com/opticalnetwork">www.ti.com/opticalnetwork</a> |
| Microcontrollers   | <a href="http://microcontroller.ti.com">microcontroller.ti.com</a> | Security            | <a href="http://www.ti.com/security">www.ti.com/security</a>             |
| Low Power Wireless | <a href="http://www.ti.com/lpw">www.ti.com/lpw</a>                 | Telephony           | <a href="http://www.ti.com/telephony">www.ti.com/telephony</a>           |
|                    |                                                                    | Video & Imaging     | <a href="http://www.ti.com/video">www.ti.com/video</a>                   |
|                    |                                                                    | Wireless            | <a href="http://www.ti.com/wireless">www.ti.com/wireless</a>             |

Mailing Address: Texas Instruments  
Post Office Box 655303 Dallas, Texas 75265